IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of **Clausse, et al.**	
Serial No.: **10/522,636**	PATENT PENDING
Filed: **January 25, 2005**	Examiner: Joseph W. Drodge
For: **Method and Installation for the Production of Lime Water from Delonised Water**	Group Art Unit: 1797
Docket No: **4195-020**	Confirmation No.: 7387

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
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February 20, 2008 — Date

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RESPONSE TO OFFICE ACTION

This paper is being filed in response to the Office Action mailed November 20, 2007 having a three-month reply due date of February 20, 2008. Reconsideration and reexamination are respectfully requested in light of the amendments and remarks below. While no fees should be required for entry of this response, if any fees or charges are required, the Commissioner is hereby authorized to charge them to Deposit Account 18-1167.

AMENDMENTS TO THE CLAIMS

1.-14. Previously canceled

15. (Currently Amended) A method of producing lime water and remineralizing water comprising:

a. deionising dilution water by membrane filtration, distillation or an ion exchange resin;

b. ~~adding~~ mixing silicate ions with ~~to~~ the deionised dilution water at a silicate ion injection site to produce a silicate ion-water mixture;

c. after mixing silicate ions with the deionised dilution water and downstream from the silicate ion injection site, mixing milk of lime with the silicate ion-water mixture in a saturator to form lime water;

d. precipitating solids in the lime water, wherein the precipitation is caused by the addition of silicate ions and milk of lime to the deionised dilution water;

e. settling precipitated solids to form sludge in the saturator;

f. discharging sludge formed in the saturator; and

g. remineralizing water to be treated by mixing carbon dioxide and the lime water into the water to be treated.

16. (Currently Amended) The method of claim 15 wherein said ~~silicates~~ silicate ions are produced from silicates selected from the group consisting of sodium silicate and potassium silicate.

17. (Currently Amended) The method of claim 16 wherein the silicate ions are produced from sodium silicate.

18. (Currently Amended) The method of claim 15 wherein the dilution water is deionised by membrane filtration including nano-filtration or reverse osmosis. ~~and wherein the water has been subjected to a nano-filtration or a filtration by reverse osmosis.~~

19. (Canceled).

20. (Currently Amended) The method of claim 15 wherein mixing the silicate ions ~~are added~~ with ~~to~~ the deionised dilution water ~~such that the resulting~~ produces the silicate ion-water mixture ~~has~~ with a concentration of approximately 5 mg/l to 40 mg/l of silicate ions.

21. (Canceled).

22. (Canceled).

23. (Currently Amended) The method ~~and system~~ of claim 22 wherein the ~~wherein the mixer is~~ silicate ions are mixed with the deionised dilution water with a static mixer or mixing tank.

24. (Currently Amended) The method ~~and system~~ of claim ~~21~~ 15 including ~~means for~~ measuring the quality of lime water produced in the saturator and ~~means to~~ varying the silicate ion dosage.

25. (Currently Amended) The method ~~and system~~ of claim ~~21~~ 24 wherein ~~including a device for measuring~~ the lime water quality is measured with a ~~where the~~ device ~~is~~ taken from the group consisting of a turbidimeter, a pH meter, and a conductivity meter.

26. (Canceled).

27. (Canceled).

28. (Currently Amended) The method of claim ~~27~~ 15 including precipitating CaH_2SiO_4 in the lime water. ~~wherein the addition of the silicate ions causes precipitation of CaH_2SiO_4.~~

29. (Canceled).

30. (Canceled).

31. (Canceled).

32. (New) The method of claim 15 including mixing a sufficient amount of silicate ions with the deionised dilution water such that when the silicate ion-water mixture is mixed with milk of lime the resulting lime water has a turbidity of less than approximately 10 NTU.

33. (New) The method of claim 15 wherein the milk of lime and the silicate ion-water mixture are mixed by spraying water into an inlet of the saturator.

34. (New) The method of claim 15 wherein the silicate ions are produced from silicates selected from the group consisting of sodium silicate and potassium silicate, wherein mixing the silicate ions with the deionised dilution water produces the silicate ion-water mixture with a concentration of approximately 5 mg/l to 40 mg/l of silicate ions, and wherein mixing the milk of lime with the silicate ion-water mixture forms lime water with a turbidity of less than approximately 10 NTU.

35. (New) The method of claim 15 including:

a. deionising dilution water with a nano-filter or reverse osmosis membrane;

b. mixing silicate ions and the deionised dilution water with a static mixer or mixing tank to produce the silicate ion-water mixture prior to the silicate ion-water mixture being directed into the saturator;

c. injecting a water spray into the saturator to mix the milk of lime and the silicate ion-water mixture; and

d. evacuating insoluable particles formed in the lime water with an insoluables trap associated with the saturator.

36. (New) A system for producing lime water comprising:

a. a deioniser for receiving and deionising dilution water;

b. a silicate ion inlet disposed downstream from the deionizer for directing silicate ions into the deionised dilution water and producing a silicate ion-water mixture;

c. a saturator disposed downstream from the deioniser and the silicate ion inlet and includes a holding tank for receiving and holding a volume of the silicate ion-water mixture;

d. an inlet for directing the silicate ion-water mixture into the saturator;

e. an inlet for directing milk of lime into the saturator holding the silicate ion-water mixture wherein the milk of lime and the silicate ion-water mixture form lime water; and

f. a sludge outlet associated with the saturator.

37. (New) The system of claim 36 including a first mixer to mix silicate ions with deionised dilution water to produce the silicate ion-water mixture prior to the silicate ion-water mixture being directed into the saturator.

38. (New) The system of claim 37 wherein the first mixer includes static mixer or a mixing tank.

39. (New) The system of claim 36 including a second mixer associated with the saturator to mix the milk of lime and the silicate ion-water mixture to form lime water.

40. (New) The system of claim 39 wherein the second mixer includes a water inlet for injecting a water spray into the saturator to mix the milk of lime and the silicate ion-water mixture.

41. (New) The system of claim 36 wherein the saturator includes an internal insoluables trap to evacuate insoluable particles formed in the lime water.

42. (New) The system of claim 36 wherein the deioniser includes a a nano-filtration membrane.

43. (New) The system of claim 36 wherein the deioniser includes a reverse osmosis membrane.

44. (New) The system of claim 36 including:

a. a static mixer or mixing tank disposed upstream from the saturator to mix silicate ions with deionised dilution water to produce the silicate ion-water mixture prior to the silicate ion-water mixture being directing into the saturator;

b. a water inlet for injecting a water spray into the saturator to mix the milk of lime and the silicate ion-water mixture;

c. an insolables trap associated with the saturator to evacuate insolubles particles formed in the lime water; and

d. a nano-filtration membrane or reverse osmosis membrane to deionise the dilution water.

REMARKS

This Response is in reply to the Office Action mailed on November 20, 2007. The Office Action indicated claims 15-31 were pending in the application with claims 15-31 being rejected.

§ 101 and § 112 Rejection

Applicants amended claims 22 – 25 to clarify that the claims are directed to a method. This amendment should overcome the § 101 and § 112 rejections.

§ 102 Rejection

The Patent Office rejected claims 29-31 under 35 U.S.C. § 102(e) as being anticipated by PCT Publication WO01/8560 (and corresponding U.S. Patent 7,273,558 (hereinafter "Miecznik"). Applicant canceled claims 29-31 and added new claims 36-44 describing similar subject matter. Under 35 U.S.C. § 102, every element or limitation of a claim must identically appear in a single prior art reference for it to anticipate the claim. It is respectfully urged that claims 36-44 define over Miecznik.

Claim 36 requires a saturator disposed downstream from a deionizer and a silicate ion inlet and includes a holding tank for receiving and holding a volume of a silicate ion-water mixture. The Examiner maintains that Miecznik's mixing valve tee 12 constitutes a saturator. Office Action, p. 2. Applicants respectfully disagree. In making this determination, the Examiner misconstrues the term "saturator."

Claim terms are given their plain and ordinary meaning as read in light of the specification and consistent with how a person of ordinary skill in the art would interpret the term. A proper construction of "saturator" is a holding tank that holds a fluid to be saturated

with another composition. Miecznik's mixing valve tee 12 is not a holding tank that holds fluid to be saturated.

Notwithstanding the above, Applicant has added claim 36 to recite the fundamental structure of a saturator, namely that the saturator includes a holding tank. Certainly the mixing valve of Miecznik is not a holding tank. For at least this reason, Miecznik cannot anticipate claim 36.

Further, claim 36 includes a silicate ion inlet for directing silicate ions into the deionised dilution water. The Patent Office maintains that Miecznik's reservoir 27 introduces "other chemical ions." However, nothing in the Miecznik disclosure suggests that reservoir 27 is a silicate ion inlet. Rather, Miecznik discloses a silo 26 that charges reservoir 27 with a suspension of dolomite or lime. This dolomite or lime suspension is added to the main flow. Since Miecznik clearly explains that reservoir 27 injects dolomite or lime into the main flow, it is improper to maintain that reservoir 27 is a silicate ion inlet. Thus, it is respectfully urged that Miecznik does not anticipate claim 36.

§ 103 Rejection

The Patent Office rejected claims 15-28 under 35 U.S.C. § 103(a) as unpatentable over U.S Patent No. 1,574,363 (hereinafter "Calvert") in view of U.S. Patent No. 3,013,981 (hereinafter "Reide"). Applicants amended claim 15 to more particularly point out and distinctly claim Applicants' invention.

To establish a prima facie case of obviousness, the prior art references must teach or suggest all the claim limitations. MPEP § 706.02(j). In combination, Calvert, Reide and Natchman fail to teach or suggest all the claim limitations and thus cannot render claims independent claim 15 and its corresponding dependent claims obvious.

Claim 15 is directed to a method of producing lime water and remineralizing water. To remineralize water, carbon dioxide and lime water are mixed with the water to be treated. None of the cited references describe a process of remineralizing water. Rather, Calvert and Reide disclose a method of forming a filter aid material that removes impurities from water. Similarly, Natchman describes a water deionization process that removes impurities from water. Thus, none of the references teach or suggest remineralizing water. For at least this reason, claim 15 and its corresponding dependent claims are not rendered obvious.

The method of claim 15 further includes precipitating solids in the lime water formed by the addition of silicate ions and milk of lime to deionised dilution water, settling the precipitated solids to form sludge and discharging the sludge. Nothing in Calvert or Reide teach or suggest precipitating solids, settling solids and discharging the resulting sludge. Calvert explains that adding lime to the diatomaceous earth and water increases the filtering rate of the resulting filter aid material. Calvert, p.1, ll. 57-65, 82-85. Similarly, Reide discloses that adding sodium silicate to diatomaceous earth and water increases the filtering rate of the resulting filter aid material. Reide, col. 4, ll. 9-20. One of ordinary skill in the art would not be motivated to precipitate and remove solids formed in Calvert and Reide because removing these solids would remove necessary flux material that causes the increased filtering rate.

For the foregoing reasons it is respectfully urged that the present application is in condition for allowance and allowance is requested.

Respectfully submitted,

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